

Work Plans for Winters Apartments, Windmere I & Windmere II

Winters Apartments Work Plan

Description of the Project:

Winters Apartments, built in 1983, is an existing affordable multi-family housing community located at 116 East Baker Street, Winters, CA. The residential buildings and landscape will be retrofitted to Zero Net Water and Zero Net Electric standards, using no more water than that which falls at the site in a year and using no more electricity in a year than is generated by the solar array. An innovative feature of this project is the Nexus eWater greywater treatment and heat pump, which will be matched to a deep landscape retrofit that uses less than 10% of the previous water usage. In addition Winters Apartments will undergo additional retrofit measures that address the deferred maintenance issues and ensures the preservation of affordable housing in the City of Winters.

Project Proponent/Partner (if applicable):

Community Housing Opportunities Corporation (CHOC)

WORK PLAN TASKS

Task 1: Direct Project Administration and Reporting:

This task includes management of the grant agreement in compliance with grant requirements, preparation and submission of supporting documents and coordination with the Grantee.

Our deliverables include:

1. Analysis and reports on existing and post-retrofit water and energy use under various scenarios to assist design development.
2. Progress Reports documenting energy and water usage (and eventually savings) at the site.
3. Invoices will be submitted on a regular basis in accordance with standard billing procedures.
4. These projects will be additionally funded by the California Tax Credit Allocation Committee (CTCAC), which requires extensive application, and documentation of compliance with applicable Labor laws, recruitment of Women and Minority Owned contractors, and Davis-Bacon wages.
5. A Labor Compliance Program will be implemented per CTCAC that ensures all Labor laws are followed.

Task 2: Easement(s)

This task is not applicable to the Project.

Task 3. Project Evaluation/Design/Engineering

This task will include the design of a Zero Net Water + Electricity retrofit for Winters Apartments by Redwood Energy. This begins with the continued water and energy use analysis of the site through usage data from utility bills and Title 24 energy modeling. This analysis is combined with CEC's California Utility Allowance Calculator, a whole-house modeling of lighting, appliances, plug loads, water and cooking, developed for the California Tax Credit Allocation Committee (CTCAC) and specific to affordable housing modeling.

Our Design Criteria uses no more water than that which falls on the sites each year, and use no more electricity than can be generated with the rooftop solar array.

In addition, an architect will develop construction documents and specs to include retrofit measures outside of the Water and Energy retrofits to address deferred maintenance issues and ensure the preservation of affordable housing for 44 families in the City of Winters.

Our deliverables include:

1. Updated Capital Needs Assessment
2. Nexus System Design for Multi-Family Housing Complex
3. Dry Farming Landscape and Irrigation Retrofit
4. Zero Net Water + Electricity Retrofit Design
5. 100% complete Construction Documents and Specifications
6. Construction Cost Estimates

Task 4. Environmental Documentation:

Winters is an existing affordable housing complex, built in 1983 and acquired by CHOC in 2003. CEQA should be met by the limited nature of the project. This Project is exempt from additional review because the Project is composed of activities already evaluated and approved by the original CEQA process and public hearings, such as normal maintenance of the property's equipment, buildings and landscape. The project does not increase or change the massing of any existing buildings or reduce open space in any way. The project is designed to reduce environmental impacts of Greenhouse Gas emissions and dramatically reduce demands on California's limited supply of potable water.

Our deliverables include:

1. CEQA Clearance/Exemption by Lead Agency
2. Updated Phase I Reports, if necessary

Task 5. Permitting:

This task involves acquisition of the permits for the Winters project. Architect will submit construction documents to local Building Department and revise documents per City's comments. CHOC will secure the necessary project permits. Approved permit set will be used as base documents for public bidding process.

Our deliverables include:

1. Approved Construction Documents/Permit Set
2. Required project permits

Task 6. Proposal Monitoring Plan:

This task involves preparation of the Proposal Monitoring Plan for the Winters Project. The UC Davis Center for Water-Energy Efficiency (CWEE) and the Western Cooling Efficiency Center (WCEC) will work as a team to develop an adequate monitoring plan that is approved by DWR. Overall water and energy use records will be used to determine the existing housing complex baseline utility use. Upon completion of the retrofit of Winters Apartments, both water and energy savings can be monitored and analyzed per the approved plan. In addition, the research centers would like to take this opportunity to evaluate the system performance during this pilot installation and extrapolate its potential for widespread use and energy savings impact in California.

Our deliverables include:

1. Preliminary and Final Monitoring Plan
2. Additional baseline data of project utility usage

Task 7. Project Construction/Implementation:

This task involves project construction contracting, implementation of the retrofit and construction administration. The larger retrofit of the project extends beyond water and energy measures. It ensures the preservation of affordable housing for 44 very low-income families in the City of Winters. It provides much needed deferred maintenance while also striving to transform an older, existing multi-family property into a zero net water and electric project in a cost effective and replicable way.

In partnership with UC Davis Center for Water-Energy Efficiency (CWEE), the Western Cooling Efficiency Center (WCEC), Redwood Energy and Deering Landscape Design, the objective of CHOCs Nexus ZNW+E Retrofit Pilot Project is to perform a range of innovative measures to develop the first Zero Net Water multifamily housing in the United States for 150 deserving low income households. Those include .5gpm bathroom faucets, 1gpm kitchen faucets, a flapperless toilet to stop toilet leaks, and an Evolve 1.5gpm showerhead with a thermostatic valve to prevent behavioral waste. At the intersect and supporting the NZW+E efforts is the Nexus eWater, a first-of-a-kind greywater heat pump that recaptures heat for the laundry center's hot water tank at a Co-efficiency Of Performance (COP) above 4.0 while treating greywater to the NSF 350 standard for landscaping use. This greywater will be the sole source of landscaping water in the new Zero Net Water landscape, which will be entirely replaced with climate-appropriate child friendly, edible and high ecological value landscape that does not otherwise rely on imported water.

As part of the project, CHOC will perform a deep residential energy efficiency retrofit combined with a Zero Net Electric solar array. Efficiency measures include additional insulation, shell sealing, duct insulation and sealing, upgraded DHW to Energy Star performance, high performance LED lighting, fuel switching to efficient heat pumps for space heating, Energy Star appliances, and a 3kw-4kW solar array per apartment for the balance of a Zero Net Electric community. As behavior is a large component of energy use, tenants will also receive the active support of certified Green Property Managers to teach conservation strategies and engage high energy users with additional assistance.

Post-retrofit the project will be monitored at least through April 2018 by the UC Davis groups and Redwood Energy to establish the performance vs. the modeled energy and water use, with emphasis on the Nexus eWater to further understand its performance and support its wider application in multifamily apartment complexes. Progress reports will be delivered quarterly, and at the conclusion of

monitoring a full report on all monitoring will be drafted for comments and redrafted for final submittal.

Our deliverables include:

1. Construction Bidding and Contracting
2. Construction Schedule/ Timeline
3. Winters Apartments Retrofit to a Zero Net Water and Electric Multi-Family Development
4. First time installation of Nexus eWater System at a Multi-Family Housing Development
5. An analysis of conformance between the T24 and CUAC energy and water use models and actual usage for the 150 households, a statistically robust sample for population-level analysis of disaggregated energy use rarely available

Windmere I Apartments Work Plan

Description of the Project:

Windmere I Apartments, built in 1994, is an existing affordable multi-family housing community located at 3100 Fifth Street Davis, CA. The residential buildings and landscape will be retrofitted to Zero Net Water and Zero Net Electric standards, using no more water than that which falls at the site in a year and using no more electricity in a year than is generated by the solar array. An innovative feature of this project is the Nexus eWater greywater treatment and heat pump, which will be matched to a deep landscape retrofit that uses less than 10% of the previous water usage. In addition Windmere I Apartments will undergo additional retrofit measures that address the deferred maintenance issues and ensures the preservation of affordable housing in the City of Davis.

Project Proponent/Partner (if applicable):

Community Housing Opportunities Corporation (CHOC)

WORK PLAN TASKS

Task 1: Direct Project Administration and Reporting:

This task includes management of the grant agreement in compliance with grant requirements, preparation and submission of supporting documents and coordination with the Grantee.

Our deliverables include:

1. Analysis and reports on existing and post-retrofit water and energy use under various scenarios to assist design development.
2. Progress Reports documenting energy and water usage (and eventually savings) at the site.
3. Invoices will be performed on a regular basis in accordance with standard billing procedures.
4. These projects will be additionally funded by the California Tax Credit Allocation Committee (CTCAC), which requires extensive application, and documentation of compliance with applicable Labor laws, recruitment of Women and Minority Owned contractors, and Davis-Bacon wages.

5. A Labor Compliance Program will be implemented per CTCAC that ensures all Labor laws are followed.

Task 2: Easement(s)

This task is not applicable to the Project.

Task 3. Project Evaluation/Design/Engineering

This task will include the design of a Zero Net Water + Electricity retrofit for Windmere I Apartments by Redwood Energy. This begins with the continued water and energy use analysis of the site through usage data from utility bills and Title 24 energy modeling. This analysis is combined with CEC's California Utility Allowance Calculator, a whole-house modeling of lighting, appliances, plug loads, water and cooking, developed for the California Tax Credit Allocation Committee (CTCAC) and specific to affordable housing modeling.

Our Design Criteria uses no more water than that which falls on the sites each year, and use no more electricity than can be generated with the rooftop solar array.

In addition, an architect will develop construction documents and specs to include retrofit measures outside of the Water and Energy retrofits to address deferred maintenance issues and ensure the preservation of affordable housing for 48 families in the City of Davis.

Our deliverables include:

1. Updated Capital Needs Assessment
2. Nexus eWater System Design for Multi-Family Housing Complex
3. Dry Farming Landscape and Irrigation Retrofit
4. Zero Net Water + Electricity Retrofit Design
5. 100% complete Construction Documents and Specifications
6. Construction Cost Estimates

Task 4. Environmental Documentation:

Windmere I Apartments is an existing affordable housing complex, built in 1994 by CHOC. CEQA should be met by the limited nature of the project. This Project is exempt from additional review because the Project is composed of activities already evaluated and approved by the original CEQA process and public hearings, such as normal maintenance of the property's equipment, buildings and landscape. The project does not increase or change the massing of any existing buildings or reduce open space in any way. The project is designed to reduce environmental impacts of Greenhouse Gas emissions and dramatically reduce demands on California's limited supply of potable water.

Our deliverables include:

1. CEQA Clearance/Exemption by Lead Agency
2. Updated Phase I Reports, if necessary

Task 5. Permitting:

This task involves acquisition of the permits for the Windmere I project. Architect will submit construction documents to local Building Department and revise documents per City's comments. CHOC will secure the necessary project permits. Approved permit set will be used as base documents for public bidding process.

Our deliverables include:

1. Approved Construction Documents/Permit Set
2. Required project permits

Task 6. Proposal Monitoring Plan:

This task involves preparation of the Proposal Monitoring Plan for the Windmere I Apartments Project. The UC Davis Center for Water-Energy Efficiency (CWEE) and the Western Cooling Efficiency Center (WCEC) will work as a team to develop an adequate monitoring plan that is approved by DWR. Overall water and energy use records will be used to determine the existing housing complex baseline utility use. Upon completion of the retrofit of Windmere I Apartments, both water and energy savings can be monitored and analyzed per the approved plan. In addition, the research centers would like to take this opportunity to evaluate the system performance during this pilot installation and extrapolate its potential for widespread use and energy savings impact in California.

Our deliverables include:

1. Preliminary and Final Monitoring Plan
2. Additional baseline data of project utility usage

Task 7. Project Construction/Implementation:

This task involves project construction contracting, implementation of the retrofit and construction administration. The larger retrofit of the project extends beyond water and energy measures. It ensures the preservation of affordable housing for 48 very low-income families in the City of Davis. It provides much needed deferred maintenance while also striving to transform an older, existing multi-family property into a zero net water and electric project in a cost effective and replicable way.

In partnership with UC Davis Center for Water-Energy Efficiency (CWEE), the Western Cooling Efficiency Center (WCEC), Redwood Energy and Deering Landscape Design, the objective of CHOCs Nexus ZNW+E Retrofit Pilot Project is to perform a range of innovative measures to develop the first Zero Net Water multifamily housing in the United States for 150 deserving low income households. Those include .5gpm bathroom faucets, 1gpm kitchen faucets, a flapperless toilet to stop toilet leaks, and an Evolve 1.5gpm showerhead with a thermostatic valve to prevent behavioral waste. At the intersect and supporting the NZW+E efforts is the Nexus eWater system, a first-of-a-kind greywater heat pump that recaptures heat for the laundry center's hot water tank at a Co-efficiency Of Performance (COP) above 4.0 while treating greywater to the NSF 350 standard for landscaping use. This greywater will be the sole source of landscaping water in the new Zero Net Water landscape, which will be entirely replaced with climate-appropriate child friendly, edible and high ecological value landscape that does not otherwise rely on imported water.

As part of the project, CHOC will perform a deep residential energy efficiency retrofit combined with a Zero Net Electric solar array. Efficiency measures include additional insulation, shell sealing, duct insulation and sealing, upgraded DHW to Energy Star performance, high performance LED lighting, fuel switching to efficient heat pumps for space heating, Energy Star appliances, and a 3kw-4kW solar array per apartment for the balance of a Zero Net Electric community. As behavior is a large component of energy use, tenants will also receive the active support of certified Green Property Managers to teach conservation strategies and engage high energy users with additional assistance.

Post-retrofit the project will be monitored at least through April 2018 by the UC Davis groups and Redwood Energy to establish the performance vs. the modeled energy and water use, with emphasis on the Nexus eWater to further understand its performance and support its wider application in multifamily apartment complexes. Progress reports will be delivered quarterly, and at the conclusion of monitoring a full report on all monitoring will be drafted for comments and redrafted for final submittal.

Our deliverables include:

1. Construction Bidding and Contracting
2. Construction Schedule/Timeline
3. Windmere I Apartments Retrofit to a Zero Net Water and Electric Multi-Family Development
4. First time installation of Nexus eWater System at a Multi-Family Housing Development
5. An analysis of conformance between the T24 and CUAC energy and water use models and actual usage for the 150 households, a statistically robust sample for population-level analysis of disaggregated energy use rarely available

Windmere II Apartments Work Plan

Description of the Project:

Windmere II Apartments, built in 1999, is an existing affordable multi-family housing community located at 3030 Fifth Street Davis, CA. The residential buildings and landscape will be retrofitted to Zero Net Water and Zero Net Electric standards, using no more water than that which falls at the site in a year and using no more electricity in a year than is generated by the solar array. An innovative feature of this project is the Nexus eWater greywater treatment and heat pump, which will be matched to a deep landscape retrofit that uses less than 10% of the previous water usage. In addition, Windmere II Apartments will undergo additional retrofit measures that address the deferred maintenance issues and ensures the preservation of affordable housing in the City of Davis.

Project Proponent/Partner (if applicable):

Community Housing Opportunities Corporation (CHOC)

WORK PLAN TASKS

Task 1: Direct Project Administration and Reporting:

This task includes management of the grant agreement in compliance with grant requirements, preparation and submission of supporting documents and coordination with the Grantee.

Our deliverables include:

1. Analysis and reports on existing and post-retrofit water and energy use under various scenarios to assist design development
2. Progress Reports documenting energy and water usage (and eventually savings) at the site
3. Invoices will be performed on a regular basis in accordance with standard billing procedures
4. These projects will be additionally funded by the California Tax Credit Allocation Committee (CTCAC), which requires extensive application, and documentation of compliance with applicable Labor laws, recruitment of Women and Minority Owned contractors, and Davis-Bacon wages
5. A Labor Compliance Program will be implemented per CTCAC that ensures all Labor laws are followed.

Task 2: Easement(s)

This task is not applicable to the Project.

Task 3. Project Evaluation/Design/Engineering

This task will include the design of a Zero Net Water + Electricity retrofit for Windmere II Apartments by Redwood Energy. This begins with the continued water and energy use analysis of the site through usage data from utility bills and Title 24 energy modeling. This analysis is combined with CEC's California Utility Allowance Calculator, a whole-house modeling of lighting, appliances, plug loads, water and cooking, developed for the California Tax Credit Allocation Committee (CTCAC) and specific to affordable housing modeling.

Our Design Criteria uses no more water than that which falls on the sites each year, and use no more electricity than can be generated with the rooftop solar array.

In addition, an architect will develop construction documents and specs to include retrofit measures outside of the Water and Energy retrofits to address deferred maintenance issues and ensure the preservation of affordable housing for 58 families in the City of Davis.

Our deliverables include:

1. Updated Capital Needs Assessment
2. Nexus System Design for Multi-Family Housing Complex
3. Dry Farming Landscape and Irrigation Retrofit
4. Zero Net Water + Electricity Retrofit Design
5. 100% complete Construction Documents and Specifications
6. Construction Cost Estimates

Task 4. Environmental Documentation:

Windmere II Apartments is an existing affordable housing complex, built in 1999 by CHOC. CEQA should be met by the limited nature of the project. This Project is exempt from additional review because the Project is composed of activities already evaluated and approved by the original CEQA process and public hearings, such as normal maintenance of the property's equipment, buildings and landscape. The project does not increase or change the massing of any existing buildings or reduce open space in any way. The project is designed to reduce environmental impacts of Greenhouse Gas emissions and dramatically reduce demands on California's limited supply of potable water.

Our deliverables include:

1. CEQA Clearance/Exemption by Lead Agency
2. Updated Phase I Reports, if necessary

Task 5. Permitting:

This task involves acquisition of the permits for the Windmere II project. Architect will submit construction documents to local Building Department and revise documents per City's comments. CHOC will secure the necessary project permits. Approved permit set will be used as base documents for public bidding process.

Our deliverables include:

1. Approved Construction Documents/Permit Set
2. Required project permits

Task 6. Proposal Monitoring Plan:

This task involves preparation of the Proposal Monitoring Plan for the Windmere II Apartments Project. The UC Davis Center for Water-Energy Efficiency (CWEE) and the Western Cooling Efficiency Center (WCEC) will work as a team to develop an adequate monitoring plan that is approved by DWR. Overall water and energy use records will be used to determine the existing housing complex baseline utility use. Upon completion of the retrofit of Windmere II Apartments, both water and energy savings can be monitored and analyzed per the approved plan. In addition, the research centers would like to take this opportunity to evaluate the system performance during this pilot installation and extrapolate its potential for widespread use and energy savings impact in California.

Our deliverables include:

1. Preliminary and Final Monitoring Plan
2. Additional baseline data of project utility usage.

Task 7. Project Construction/Implementation:

This task involves project construction contracting, implementation of the retrofit and construction administration. The larger retrofit of the project extends beyond water and energy measures. It ensures the preservation of affordable housing for 58 very low-income families in the City of Davis. It provides much needed deferred maintenance while also striving to transform an older, existing multi-family property into a zero net water and electric project in a cost effective and replicable way.

In partnership with UC Davis Center for Water-Energy Efficiency (CWEE), the Western Cooling Efficiency Center (WCEC), Redwood Energy and Deering Landscape Design, the objective of CHOCs Nexus ZNW+E Retrofit Pilot Project is to perform a range of innovative measures to develop the first Zero Net Water multifamily housing in the United States for 150 deserving low income households. Those include .5gpm bathroom faucets, 1gpm kitchen faucets, a flapperless toilet to stop toilet leaks, and an Evolve 1.5gpm showerhead with a thermostatic valve to prevent behavioral waste. At the intersect and supporting the NZW+E efforts is the Nexus eWater, a first-of-a-kind greywater heat pump that recaptures heat for the laundry center's hot water tank at a Co-efficiency Of Performance (COP) above 4.0 while treating greywater to the NSF 350 standard for landscaping use. This greywater will be the sole source of landscaping water in the new Zero Net Water landscape, which will be entirely replaced with climate-appropriate child friendly, edible and high ecological value landscape that does not otherwise rely on imported water.

As part of the project, CHOC will perform a deep residential energy efficiency retrofit combined with a Zero Net Electric solar array. Efficiency measures include additional insulation, shell sealing, duct insulation and sealing, upgraded DHW to Energy Star performance, high performance LED lighting, fuel switching to efficient heat pumps for space heating, Energy Star appliances, and a 3kw-4kW solar array per apartment for the balance of a Zero Net Electric community. As behavior is a large component of energy use, tenants will also receive the active support of certified Green Property Managers to teach conservation strategies and engage high energy users with additional assistance.

Post-retrofit the project will be monitored at least through April 2018 by the UC Davis groups and Redwood Energy to establish the performance vs. the modeled energy and water use, with emphasis on the Nexus eWater to further understand its performance and support its wider application in multifamily apartment complexes. Progress reports will be delivered quarterly, and at the conclusion of monitoring a full report on all monitoring will be drafted for comments and redrafted for final submittal.

Our deliverables include:

1. Construction Bidding and Contracting
2. Construction Schedule/ Timeline
3. Windmere II Apartments Retrofit to a Zero Net Water and Electric Multi-Family Development
4. First time installation of Nexus eWater System at a Multi-Family Housing Development
5. An analysis of conformance between the T24 and CUAC energy and water use models and actual usage for the 150 households, a statistically robust sample for population-level analysis of disaggregated energy use rarely available